G

United States Patent and Trademark Office

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,640	07/15/2003	Hideki Sugiura	240356US0	5239

22850 7590 10/04/2007
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

NOTIFICATION DATE	DELIVERY MODE
10/04/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)
	10/618,640	SUGIURA ET AL.
	Examiner	Art Unit
	Janis L. Dote	1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 16-20* is/are pending in the application.

4a) Of the above claim(s) *19 and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/7/07*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on May 15, 2007, has been entered.

2. The examiner acknowledges the cancellation of claim 15 filed on May 15, 2007. Claims 1-14 and 16-20 are pending.

3. The "Amendment to the specification" section filed on May 15, 2007, did not comply with 37 CFR 1.121 for the reasons discussed in the Notice of Non-compliant amendment mailed on Aug. 3, 2007. Accordingly, that "Amendment to the specification" section has not been entered.

4. The examiner acknowledges applicants' elected species, oxide particles comprising the metal element Ti, set forth in the response filed on Aug. 22, 2005. Claims 1-14 and 16-18 read on the elected species.

Accordingly, claims 19 and 20 have been withdrawn from

further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention and nonelected species of invention, there being no allowable generic or linking claim. Applicants timely traversed the restriction (election) requirement in Aug. 22, 2005.

5. The examiner has considered has considered the US application listed on the "List of related cases" in the information disclosure statement filed on Feb. 7, 2007.

6. The objection to the specification set forth in the office action mailed on Feb. 15, 2007, paragraph 5, has been withdrawn in response to the new paragraph inserted at page 41 filed on Aug. 9, 2007.

The rejections of claim 15 under 35 U.S.C. 112, second and first paragraphs, set forth in the office action mailed on Feb. 15, 2007, Sep. 7, 2006, paragraphs 7 and 9, respectively, have been mooted by the cancellation of claim 15 filed on May 15, 2007.

The rejection of claim 15 under 35 U.S.C. 102(a)/103(a) over European Patent 1,319,992 A1 (EP'992) set forth in the office action mailed on Feb. 15, 2007, paragraph 11, has been mooted by the cancellation of claim 15 filed on May 15, 2007.

The rejections of claims 1-10 under 35 U.S.C. 102(a)/103(a) and under 35 U.S.C. 102(b)/103(a) over US 6,248,495 B1 (Inokuchi), as evidenced by applicants' admissions III and of claims 11-18 under 35 U.S.C. 103(a) over Inokuchi combined with the other cited references, set forth in the office action mailed on Feb. 15, 2007, paragraphs 13-17, have been withdrawn in response to the Rule 132 declaration, which was executed by Hideki Sugiura on May 14, 2007, and filed on May 15, 2007. That declaration is sufficient to show that the hydrophobic spherical silicon oxide particles in Inokuchi example 1 do not satisfy the particle size relationship of $R/4 < \sigma < R$, where R is the primary particle diameter in number average and σ is the standard deviation of the particle size distribution of the primary particle diameter recited in the instant claims.

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 4,983,369 (Barder), as evidenced by applicants' admissions at page 39, lines 20-23, page 40, lines 9-14, and

page 41, lines 3-4, of the instant specification (applicants' admission II).

Barder teaches microspheres of silicon oxide having an average particle diameter 0.3 μm ± 0.1 μm, i.e., 300 nm ± 100 nm. Example VIII at cols. 8-9. The microspheres meet the compositional limitations recited in instant claim 1.

Barder does not expressly state that the average particle diameter is a number average particle diameter. Nor does Barder state that the microspheres of silicon oxide have circularities SF1 and SF2 as recited in the instant claims. However, the numerical value of the Barder average particle size of 300 nm is within the range of numerical values of the number average particle diameter of 30 nm to 300 nm recited in instant claim 1. The numerical value of the Barder standard deviation of the average particle diameter of 100 nm also is within the numerical value of standard deviation σ ranges recited in instant claims 1 and 3. According to Barder, the particle size is determined by examining a scanning electron microscope (SEM) photograph of the particles. Col. 7, lines 4-7. The instant specification at page 39, lines 20-23, and at page 40, lines 9-14, discloses that the number average particle diameter can be determined by using a scanning electron microscope. Thus, it is reasonable to conclude that the Barder average particle diameter and standard

deviation are based on a number average as recited in the instant claims. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980). In addition, as discussed supra, the Barder silicon oxide particles are described as being "microspheres." See, for example, Fig. 2. According to the instant specification at page 41, lines 3-4, "[i]f a particle is exactly spherical, the particle has both SF1 and SF2 of 100." Accordingly, because the Barder silicon oxide particles are described as "microspheres," it is reasonable to presume that they have a SF1 value and a SF2 value as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Applicants' arguments filed on May 15, 2007, have been fully considered but they are not persuasive.

Applicants assert that the Rule 132 declaration, which was executed by Hideki Sugiura on May 14, 2007, and filed on May 15, 2007, shows that the Barder silica particles do not have a standard deviation σ that satisfies the particle size distribution relationship recited in instant claim 1. As noted by applicants, the Rule 132 declaration calculates the standard deviation from the electron photomicrograph shown in Figure 2 of Barber. The declaration at page 3 states that based on the information in Barder Figure 2, the silica particles number

average primary particle diameter and particle diameter standard deviation were calculated to be 1.13 µm and 0.03 µm, respectively. The declaration concludes that the oxide fine particles do not satisfy the relation $R/4 \leq \sigma \leq R$, where R is the number average primary particle diameter.

Applicants' assertions are not persuasive. The electron photomicrograph represents the silica particles in Example II. However, the above rejection of claims 1, 3, and 4 is over Barber Example VIII at cols. 8-9, not Example II. As discussed in the rejection above, the Barder microspheres of silicon oxide in Example VIII have an average particle size of 300 nm ± 100 nm. The Barder standard deviation of 100 nm is within the numerical value of the standard deviation σ ranges recited in instant claims 1 and 3. According to Barber, in Example II, the silica particles have an average particle diameter of 1.1 µm ± 0.1 µm, i.e., 1100 nm ± 100 nm. See example II at col. 7. The average particle size of 1.1 µm is outside the range of numerical values of the number average particle diameter of 30 to 300 nm recited in instant claim 1. Even the Barber standard deviation of ± 0.1 µm is outside the numerical values of the standard deviation σ range of 367 to 1100 nm (i.e., 1100/4 to 1100) according to claim 1. Accordingly, the showing in the declaration does not appear to be a probative comparison to

Barber Example VIII. Applicants have not met their burden by providing any objection evidence to show that the Barder average particle diameter and standard deviation in Example VIII are not based on a number average as recited in the instant claims. Nor have applicants met their burden by providing any objection evidence to show that the Barder microspheres of silicon oxide in Example VIII do not have a SF1 value and a SF2 value as recited in the instant claims. Accordingly, the rejection of claims 1, 3, and 4 over Barder stand.

9. Claims 1-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2003/0044706 A1 (Konya), as evidenced by applicants' admissions in the instant specification at page 41, lines 3-4, and in Tables 1 and 2, examples 1-13 and comparative examples 1-4 (applicants' admission III).

Konya discloses hydrophobic spherical complex oxide particles comprising silica and titania. The hydrophobic spherical complex oxide particles have a particle size distribution of 40 to 180 nm. The hydrophobic spherical complex oxide particles are obtained by surface treating spherical complex oxide particles with hexamethyldisilazane. See example 6 in paragraphs 0058 to 0060 and in Table 1 at page 6.

Hexamethyldisilazane is represented by the formula $R^1{}_3SiNHSiR^1{}_3$ where R^1 is methyl. See paragraph 0050. According to Konya, the hexamethyldisilazane introduces a $R^1{}_3SiO_{1/2}$ unit on the surface of the complex oxide particles, where R^1 is methyl. See Konya, paragraphs 0047-0049. Konya at paragraphs 0047-0048 discloses that the surface of the hydrophobized complex oxide particles has surface units of formula (1) $R^1{}_xR^2{}_yR^3{}_zSiO_{(4-x-y-z)/2}$, where each R is substituted or unsubstituted monovalent hydrogen group having 1 to 6 carbon atoms, and x, y, and z each are an integer of 0 to 3, and x+y+z is from 1 to 3. For hexamethyldisilazane, x is 3, y and z are 0, and formula (1) is $R^1{}_3SiO_{1/2}$ where R^1 is methyl. The Konya hydrophobic spherical complex oxide particles meet the compositional limitations recited in instant claims 1 and 5-10.

Konya does not disclose that its spherical hydrophobic complex oxide particles have circularities SF1 and SF2 as recited in the instant claims. Nor does Konya disclose that its spherical hydrophobic complex oxide particles have a number average particle size and standard deviation σ of a particle size distribution as recited in the instant claims. However, as discussed above, the Konya hydrophobic spherical complex oxide particles meet the compositional limitations recited in the instant claims. Konya describes the hydrophobic complex oxide

particles as "spherical." See paragraph 0046 and example 6. The particles have a particle size distribution of 40 to 180 nm.

According to the instant specification at page 41, lines 3-4, "[i]f a particle is exactly spherical, the particle has both SF1 and SF2 of 100." The instant specification also discloses that the toners comprising oxide particles having the SF1 and SF2 values, the number average particle size, and the particle size distribution recited in the instant claims provide images with very little or no "hollow defects." See Table 1, examples 1-13. Table 1 shows that when the oxide particles have SF1 and SF2 values that are not within the ranges recited in the instant claims, the toner provides images having "hollow defects." Comparative example 4 in Tables 1 and 2, where the SF1 is 131 and the SF2 is 127. Table 1 also shows that when the oxide particles do not have the number average particle size or a particle size distribution as recited in the instant claims, the toner provides images having "hollow defects." The "hollow defects" are formed from untransferred toner. Comparative examples 1 and 2 in Tables 1 and 2, where the number average particle size is 310 nm and 28 nm, respectively; and comparative example 3 in Tables 1 and 2, where σ is about 0.09R. According to Konya, when its hydrophobic complex oxide particles are used as an external additive in toners, the toners have improved

fluidity and cleaning characteristics, as well as stable and uniform charging characteristics. Paragraph 0007. The toners provide images with no white spots, i.e., no adhesion of the toner to the photoconductor. In other words, there is no untransferred toner. Paragraph 0067 and Table 1, example 6. These properties appear to be the same properties sought by applicants. Accordingly, because the Konya hydrophobic complex oxide particles in example 6 meet the compositional limitations recited in the instant claims and are described as "spherical," and because when said hydrophobic spherical complex oxide particles are used as the external additive in toners, the toners appear to have the properties sought by applicants, it reasonable to presume that the Konya spherical hydrophobic complex oxide particles have the SF1 value, the SF2 value, the number average particle size, and the particle size distribution as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Konya, as evidenced by applicants' admission III, combined with US 2001/0051270 A1 (Yamashita).

Konya, as evidenced by applicants' admission III, discloses hydrophobic spherical complex oxide particles as described in

paragraph 9 above, which is incorporated herein by reference. As discussed in paragraph 9 above, Konya discloses that the hydrophobic spherical complex oxide particles are obtained by surface treating spherical complex oxide particles with hexamethyldisilazane, which introduces a $R^1{}_3SiO_{1/2}$ unit on the surface of the complex oxide particles.

Yamashita teaches that hydrophobic inorganic particles, such as hydrophobic silica particles, can be further treated with a silicone oil, such that the oil-treated inorganic particles have a free silicone degree, i.e., liberation degree of silicone oil of 10 to 70%. Paragraphs 0025-0027 and 0105-0110; and paragraph 0102, which discloses that the inorganic particles can be treated with a hydrophobizing agent before the silicone oil treatment. The free silicone degree of 10 to 70% meets the liberation degree of silicone oil range of 10 to 95% recited in instant claim 11. According to Yamashita, when said oil-treated silica particles are used as an external additive in a toner, the toner provides good quality images with "good fixing property without causing image omissions even when used for paper-drive image forming method." Paragraph 0022. According to Yamashita, "[w]hen the free silicone degree is too small, the effect (i.e., to prevent image omissions) can hardly be exerted. To the contrary, when the free silicone degree is

too large, adverse effects such as deterioration of resolution and image density of the resultant images are exerted." Paragraphs 0046 and 0050. Thus, the reference recognizes that the free silicone degree is a result-effective variable. The variation of a result-effective variable is presumably within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art to further treat the Konya hydrophobic spherical complex oxide particles with silicone oil as taught by Yamashita, such that the resultant silicone oil treated hydrophobic spherical complex oxide particles have a free silicone degree of 10 to 70%. That person would have had a reasonable expectation of successfully obtaining silicone oil treated hydrophobic spherical complex oxide particles that, when used as an external additive in a toner provided, the resulting toner provides good quality images with "good fixing property without causing image omissions" as disclosed by Yamashita.

11. Claims 12-14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konya, as evidenced by applicants' admission III, combined with US 6,080,519 (Ishiyama).

Konya, as evidenced by applicants' admission III, discloses hydrophobic spherical complex oxide particles as described in paragraph 9 above, which is incorporated herein by reference.

Konya further discloses a two-component developer comprising a carrier and a color toner. The color toner comprises: (1) color toner particles; and (2) the hydrophobic spherical complex oxide particles of example 6. Paragraphs 0061 and 0067. The hydrophobic spherical complex oxide particles of example 6 are present in an amount of 2.4 parts by weight based on 100 parts by weight of the toner, which meets the amount ranges recited in instant claims 13 and 14. The amount of 2.4 parts by weight per 100 parts by weight of toner is determined from the information provided in paragraph 0061 (i.e., 1/(40+1)). The toner particles comprise a polyester binder resin, which meets the toner binder resin limitation recited in instant claim 17.

The Konya toner particles have an average particle size of 7 μm. Konya does not expressly describe the average particle size as a volume average particle size as recited in instant claims 12 and 18. However, the numerical value of the average particle size is within the range of numerical values of the volume average particle size of 2 to 7 μm recited in instant claims 12 and 18.

Ishiyama teaches that when the volume average particle size of the toner is less than 2 µm, the charge property of the toner is insufficient and lowers the developing property (i.e., developing quality). If the volume average particle size is greater than 9 µm, the resolution of the image is degraded. Col. 7, lines 22-27. The range of 2 to 9 µm overlaps the range of 2 to 7 µm recited in instant claims 12 and 18. Thus, the toner art recognizes the volume average particle size as being a result-effective variable. The variation of a result-effective variable is presumably within the skill of the person having ordinary skill in the art.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Ishiyama, to adjust, through routine experimentation, the particle size of the toner particles disclosed by Konya, such that the resultant toner particles have a volume average particle size within the scope of instant claims 12 and 18. That person would have had a reasonable expectation of successfully obtaining a toner that provides images with improved resolution.

12. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Konya, as evidenced by applicants'

admission III, combined with Ishiyama, as applied to claim 12 above, further combined with US 5,554,478 (Kuramoto).

Konya, as evidenced by applicants' admission III, combined with the teachings in Ishiyama renders obvious a color toner as described in paragraph 11 above, which is incorporated herein by reference.

Konya does not exemplify color toner particles comprising a polyol resin binder as recited in instant claim 16.

Kuramoto discloses a polyol binder resin that comprises a main chain portion containing an epoxy resin moiety and a polyoxyalkylene moiety. Col. 3, lines 52-56. The polyol binder resin is synthesized by reacting (1) an epoxy resin, (2) a dihydric phenol, and (3) either an alkylene oxide adduct of a dihydric phenol or a glycidyl ether thereof. See Synthesis Example 1 at col. 8. Said binder resin meets the polyol recited in instant claim 16. According to Kuramoto, color toners comprising said binder resin provide images with excellent color reproducibility and uniform glossiness. Col. 3, lines 32-35, and col. 19, lines 14-17. Said toners also have excellent environmental stability. Col. 3, lines 39-41.

It would have been obvious for a person having ordinary skill in the art to use the Kuramoto polyol binder resin as the binder resin in the toner rendered obvious over the combined

teachings of Konya, as evidenced by applicants' admission III, and Ishiyama. That person would have had a reasonable expectation of successfully obtaining a color toner that has excellent environmental stability and that provides color images with excellent color reproducibility and uniform glossiness.

13. Claims 1, 4, and 9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 01/98211 A1 (Shibasaki), as evidenced by applicants' admissions at page 41, lines 3-4, of the instant specification (applicants' admission IV).

US 7,083,770 B2 (US'770), filed under 35 U.S.C. 371, is the national stage of the WO application of Shibasaki, and therefore is presumed to be an accurate English-language translation of the WO application of Shibasaki. 35 USC 371(c)(2), 372(b), and 365(c). See US'770, the translation of Shibasaki, for cites.

Shibasaki teaches silica particles having a number median particle size 0.195 μm, i.e., 195 nm, and a 10% and a 90% accumulated particle size of 0.116 μm and 0.250 μm, respectively, i.e., 116 nm and 250 nm, respectively. US'770, example 1 at col. 9, line 23, to col. 10, line 16, and in Fig. 2 and Table 1. Shibasaki teaches that the silica particles have a particle shape being "near [a] true sphere." US'770, col. 7,

lines 27-29. Shibasaki further teaches that the silica particles can be surface treated with an organosilane coupling agent. US'770, col. 8, lines 41-48. Shibasaki teaches silica particles that meet the compositional limitations recited in the instant claims.

Shibasaki does not disclose that its silica particles have a particle diameter standard deviation σ that satisfies the relationship recited in the instant claims. Nor does Shibasaki state that its silica particles have circularities SF1 and SF2 as recited in the instant claims. However, as discussed above, the Shibasaki silica particles of example 1 have a number average particle size of 195 nm, which is within the range of 30 to 300 nm recited in instant claim 1. For a number average particle diameter of 195 nm, the standard deviation σ satisfies the relationship recited in instant claim 1 when it ranges from 48.75 to 195 nm. Fig. 2 is a graph that shows the particle size distribution of the silica particles of example 1 of Shibasaki. US'770, col. 9, lines 9-11. The particle distribution curve for the silica particles in example 1 appears to be symmetric. From the graph in Fig. 2, it appears that the silica particles in example 1 have particle sizes that range from about 0.075 to about 0.4 μm, i.e., about 75 to about 400 nm. The differences between the median size 195 nm and the limits about 75 and about

400 nm are about 120 nm and about 205 nm, respectively. The differences of about 120 nm and about 205 nm are larger than the lower limit, i.e., 48.75 nm, of standard deviation range required in instant claim 1. The difference of about 120 nm is smaller than the upper limit, i.e., 195 nm, of that range; while the difference of about 205 nm is just slightly larger than the upper limit, i.e., 195 nm. Thus, it is reasonable to conclude that the silica particles in example 1 of Shibasaki have a standard deviation σ that satisfies the relationship recited in instant claim 1. The burden is on applicants to prove otherwise. Fitzgerald, supra. In addition, as discussed supra, Shibasaki describes the shape of its silica particles as being "near [a] true sphere." According to the instant specification at page 41, lines 3-4, "[i]f a particle is exactly spherical, the particle has both SF1 and SF2 of 100." Accordingly, because the shape of the Shibasaki silica particles is described as being "near [a] true sphere," it is reasonable to presume that they have a SF1 value and a SF2 value as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shibasaki, as evidenced by applicants'

admission IV, combined with Yamashita. See US'770, the translation of Shibasaki, for cites.

Shibasaki, as evidenced by applicants' admission IV, discloses silica particles as described in paragraph 13 above, which is incorporated herein by reference.

Shibasaki does not disclose that its silica particles are treated with a silicone oil, where the liberation degree of the silicone oil is 10% to 95% as recited in instant claim 11. However, Shibasaki teaches that its silica particles may be surface treated with a silicone oil. US'770, col. 8, lines 47-51. Shibasaki further teaches that its silica particles may be used as an external agent for a toner. US'770, col. 3, lines 40-42, and example 3 at cols. 12-13.

Yamashita teaches that inorganic particles, such as silica particles, can be treated with a silicone oil, such that the oil-treated inorganic particles have a free silicone degree, i.e., liberation degree of silicone oil of 10 to 70%. Paragraphs 0025-0027 and 0105-0110. The free silicone degree of 10 to 70% meets the liberation degree of silicone oil range of 10 to 95% recited in instant claim 11. According to Yamashita, when said oil-treated silica particles are used as an external additive in a toner, the toner provides good quality images with "good fixing property without causing image omissions even when

used for paper-drive image forming method." Paragraph 0022. According to Yamashita, "[w]hen the free silicone degree is too small, the effect (i.e., to prevent image omissions) can hardly be exerted. To the contrary, when the free silicone degree is too large, adverse effects such as deterioration of resolution and image density of the resultant images are exerted." Paragraphs 0046 and 0050. Thus, the reference recognizes that the free silicone degree is a result-effective variable. The variation of a result-effective variable is presumably within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art to surface treat the Shibasaki silica particles in example 1 with silicone oil as taught by Yamashita, such that the resultant silicone oil treated silicon oxide particles have a free silicone degree of 10 to 70%. That person would have had a reasonable expectation of successfully obtaining silicone oil treated silicon oxide particles that when used as an external additive in a toner provided, the resulting toner provides good quality images with "good fixing property without causing image omissions" as disclosed by Yamashita.

15. Claims 12-14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,013,405 (Takano) combined

with Shibasaki, as evidenced by applicants' admission IV. See US'770, the translation of Shibasaki, for cites.

Takano discloses a two component developer comprising a carrier and a negatively chargeable toner that comprises toner particles that have a volume average particle diameter of 7.0 μm. The toner particles comprise a styrene acrylic resin as the binder resin, carbon black as the coloring agent, and the charge control agent C1. See charge control agent C1 at cols. 5 and 6; col. 5, lines 42-45; and example 1 at col. 10, lines 4-22, and at col. 11, lines 12-22. The toner further comprises 0.3 parts by weight of hydrophobic silica particles per 100 parts by weight of toner particles. Col. 11, lines 12-14. The amount of hydrophobic silica particles is within the amount ranges recited in instant claims 13 and 14. Takano further discloses that the toner binder resin can also be a polyester resin, which meets the binder resin limitation recited in instant claim 17. Col. 4, line 43.

Takano does not exemplify a toner comprising the external additive comprising the oxide particles recited in the instant claims. However, Takano does not limit the type of externally added silica particles used. Col. 8, lines 18-23.

Shibasaki, as evidenced by applicants' admission IV, teaches silica particles as described in paragraph 13 above,

which is incorporated herein by reference. Shibasaki further teaches that the silica particles in example 1 are surface treated with an organopolysiloxane to form hydrophobic silica particles. See US'770, example 3. According to Shibasaki, said hydrophobic silica particles can be used as an external toner additive. US'770, col. 3, lines 40-42, and example 3. According to Shibasaki, the absolute triboelectric charge to specific BET surface area of the hydrophobic silica particles in example 3 is 25.2 μC/m^2. US'770, col. 12, line 34. According to Shibasaki, because the absolute triboelectric charge to specific BET surface area of its silica particles is greater than 20 μC/m^2, when the silica particles are externally added to a toner, a toner having "quick standup of electrification can be obtained." US'770, col. 8, lines 34-40. In example 3, Shibasaki exemplifies a developer comprising a carrier and negatively chargeable toner comprising the hydrophobic silica particles that have the absolute triboelectric charge to specific BET surface area of 25.2 μC/m^2. Said developer is reported to provide 50,000 "good picture characteristic" images.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Shibasaki, to use the hydrophobic silica oxide particles taught by Shibasaki as the hydrophobic silica particles in the toner in the two-

component developer disclosed by Takano. That person would have had a reasonable expectation of successfully obtaining a developer that provides "good picture characteristic" images after repeated use as taught by Shibasaki.

16. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takano combined with Shibasaki, as evidenced by applicants' admission IV, as applied to claim 12 above, further combined with Kuramoto. See US'770, the translation of Shibasaki, for cites.

Takano combined with Shibasaki, as evidenced by applicants' admission IV, renders obvious a two component developer as described in paragraph 15 above, which is incorporated herein by reference.

Takano does not exemplify toner particles comprising a polyol resin binder as recited in instant claim 16.

Kuramoto discloses the use of a polyol binder resin that comprises a main chain portion containing an epoxy resin moiety and a polyoxyalkylene moiety as a toner binder resin. The discussion of Kuramoto in paragraph 12 above is incorporated herein by reference. As discussed in paragraph 12 above, according to Kuramoto, toners comprising said binder resin have excellent environmental stability. Col. 3, lines 39-41.

Kuramoto further teaches that carbon black may be used as a toner coloring agent. Col. 6, lines 57-60.

It would have been obvious for a person having ordinary skill in the art to use the Kuramoto polyol binder resin as the binder resin in the toner rendered obvious over the combined teachings of Takano and Shibasaki, as evidenced by applicants' admission IV. That person would have had a reasonable expectation of successfully obtaining a two-component developer that has excellent environmental stability.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Janis L. Dote
JANIS L. DOTE
PRIMARY EXAMINER
GROUP ~~1500~~ 1700

JLD
Sep. 27, 2007